NASA/SP—1999-7501/SUPPL3

NASA THESAURUS SUPPLEMENT

A three-part cumulative update of the
1998 edition of the *NASA Thesaurus*

July 1999

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  NASA Center for AeroSpace Information
  7121 Standard Drive
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NASA/SP—1999–7501/SUPPL3

NASA THESAURUS SUPPLEMENT

A three-part cumulative update of the
1998 edition of the *NASA Thesaurus*

**National Aeronautics and
Space Administration**

July 1999

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Introduction

This Supplement is a cumulative update to the 1998 edition of the *NASA Thesaurus* (NASA/SP—1998–7501). The update includes all new terms and associated hierarchies added between the cut-off for the 1998 edition (December 1997) through June 30, 1999. Parts 1 and 2 of thi *Supplement* correspond to Volumes 1 and 2 of the printed edition of the *NASA Thesaurus*. Supplements are normally published every six months.

Part 1 (*Hierarchical Listing*) contains the full hierarchical structure for each new term along with all new cross references and term definitions.

Display elements comprising the hierarchical listing are as follows:

Display Element	**Notation**
Generic Structure	GS
Related Term	RT
Use	USE
Use For	UF
Scope Note	SN
Definition	DEF
Array Terms	∞

For a fuller explanation, see the Introduction (pages viii–xi) in the printed version of the 1998 *NASA Thesaurus*, Volume 1.

Part 2 (*Rotated Term Display*) is a ready reference tool which provides additional 'access points' to the thesaurus terminology. It contains the postable terms and nonpostable cross references found in the Hierarchical Listing (Part 1) arranged in a KWIC (key-word-in-context) index.

Part 3 (*Changes*) is a listing of deletions or changes to postable terms or USE references made since the 1998 edition of the *NASA Thesaurus*. To control the size of the Supplement, only significant changes in term hierarchies and related term lists are presented.

NOTE: Other resources and products related to the NASA Thesaurus can be found at the following URL: **http://www.sti.nasa.gov/thesfrm1.htm**.

In addition to the above mentioned resources, a thesaurus listserv has been set up for submitting candidate terms and discussion of related lexicographical issues. A listing of candidate and accepted new terms is posted monthly. To subscribe to this listserv, send an e–mail message to **listserv@sti.nasa.gov**. Leave the subject line blank and in the message section, type **SUBSCRIBE THESAURUS–L <Your name>**. (Should you wish to cancel your subscription, send a message to the same address with UNSUBSCRIBE in the message section.)

Comments and suggestions regarding the NASA Thesaurus should be directed to:

Lexicographer
NASA Center for AeroSpace Information
7121 Standard Drive
Hanover, MD 21076–1320

E–mail: help@sti.nasa.gov
Fax: (301) 621–0134
Telephone: (301) 621–0114

NASA THESAURUS SUPPLEMENT

PART 1
HIERARCHICAL LISTING

A

aeroshells
(added May 1999)
DEF Aerodynamic structural shells that attach to, or comprise a portion of, the exterior of an aerospace vehicle or space probe, especially such structures that support atmospheric entry, aerobraking, aeroassist, or hypersonic flight.
GS aerodynamic configurations
aeroshells
RT aeromaneuvering
nose cones
reentry vehicles
spacecraft design
spacecraft shielding
spacecraft structures

Alpha Magnetic Spectrometer
(added June 1998)
UF *AMS (spectrometer)*
GS measuring instruments
spectrometers
Alpha Magnetic Spectrometer
RT antimatter
Cerenkov counters
cosmic rays
dark matter
International Space Station
interstellar matter
magnetic spectroscopy
space station payloads
spaceborne astronomy

AM-1 (EOS) spacecraft
USE **Terra spacecraft**

AMS (spectrometer)
USE **Alpha Magnetic Spectrometer**

anisoplanatism
(added May 1999)
DEF In adaptive optics (AO) systems, a performance-degrading effect that arises whenever light from the wave front sensor beacon and light from the target object sample different volumes of optical turbulence. This effect results in an increased value of the aperture-averaged residual phase variance after AO compensation, which causes an exponential decrease in system performance.
RT aberration
adaptive optics
atmospheric correction
atmospheric optics
image resolution
optical correction procedure
phase error
telescopes

antenna gain
(added June 1998)
GS amplification
antenna gain
RT antennas
automatic gain control
directional antennas
effectiveness
horn gain
signal reception

antiphase boundaries
(added March 1998)
UF *antiphase domains*
APB (materials)
GS boundaries
antiphase boundaries
RT binary alloys
crystal dislocations
crystal lattices
crystal structure
grain boundaries
interfacial energy
intermetallics
microstructure
order-disorder transformations
solid solutions
solid-solid interfaces
superlattices
ternary alloys

antiphase domains
USE **antiphase boundaries**

APB (materials)
USE **antiphase boundaries**

archaeomagnetism
USE **paleomagnetism**

B

bevel gears
(added May 1999)
GS gears
bevel gears
spiral bevel gears
RT gear teeth

Biot-Savart law
(added August 1998)
DEF Law describing the intensity of a magnetic field produced by a current carrying wire. Also applied in fluid dynamics to describe the flow velocity field induced by a vortex.
GS laws
Biot-Savart law
RT electromagnetism
flow velocity
magnetic fields
Maxwell equation
vortices

Boeing 717 aircraft
(added October 1998)
GS Boeing aircraft
Boeing 717 aircraft
commercial aircraft
Boeing 717 aircraft
jet aircraft
turbofan aircraft
Boeing 717 aircraft
monoplanes
Boeing 717 aircraft
passenger aircraft
Boeing 717 aircraft
transport aircraft
Boeing 717 aircraft
RT co aircraft

bohrium
(added May 1998)
GS chemical elements
bohrium
RT hassium
seaborgium

C

cascode devices
(added August 1998)
DEF Amplifier devices consisting of a common grounded-emitter (cathode) or source stage that drives a grounded-base output stage, resulting in high-impedance, high-gain, and low-noise.
GS amplifiers
cascode devices
electronic equipment
solid state devices
semiconductor devices
cascode devices
RT CMOS
field effect transistors
high electron mobility transistors
switching circuits
transistor amplifiers
transistor circuits
transistors

chain reactions (chemistry)
(added May 1999)
GS chemical reactions
chain reactions (chemistry)
RT chemical lasers
combustion chemistry

chain reactions (nuclear physics)
(added May 1999)
GS nuclear reactions
nuclear fission
chain reactions (nuclear physics)
RT fission products
neutrons

Chandra X Ray Astrophysics Facility
USE **X Ray Astrophysics Facility**

clamped structures
(added February 1998)
RT beams (supports)
clamps
composite structures
joints (junctions)
laminates
plates (structural members)
shells (structural forms)
structural members
structural vibration
co structures

Comet Nucleus Tour
(added February 1999)
DEF A NASA Discovery-class mission to acquire imagery and comparative spectral maps of comet nuclei and analyze comet dust flows. The

mission spacecraft will fly to within 100 kilometers of at least three near-Earth comets including Comet Encke, Comet Schwassmann-Wachmann, and Comet d'Arrest.
UF *CONTOUR (mission)*
GS space missions
flyby missions
Comet Nucleus Tour
RT comet nuclei
Encke comet
Schwassmann-Wachmann comet
swingby technique

CONTOUR (mission)
USE **Comet Nucleus Tour**

corrugated waveguides
(added February 1998)
GS waveguides
corrugated waveguides
RT gratings (spectra)
optical waveguides
waveguide antennas

cuprates
(added April 1999)
GS copper compounds
cuprates
RT BSCCO superconductors
copper oxides
YBCO superconductors

cycloaddition
(added June 1998)
DEF Pericyclic chemical reaction in which unsaturated molecules combine to form a cyclic compound under the influence of heat or light.
GS chemical reactions
cycloaddition
Diels-Alder reactions
RT cyclic compounds
photochemical reactions
polymerization
synthesis (chemistry)

D

Darkstar unmanned aerial vehicle
USE **pilotless aircraft**
reconnaissance aircraft

Deep Space 1 Mission
(added October 1998)
DEF First of several technology demonstration missions supporting the NASA New Millennium Program. Advanced technologies include an ion propulsion system, solar concentrator arrays, autonomous navigation and control systems, an integrated camera and imaging spectrometer, and several telecommunications and microelectronics devices. The mission plan includes a flyby of Asteroid 1992 KD.
UF *DS1 (space mission)*
GS space missions
Deep Space 1 Mission
RT asteroid missions
autonomous navigation
flyby missions
interplanetary spacecraft
ion propulsion
NASA space programs
solar electric propulsion

deformable mirrors
(added May 1998)
GS mirrors
deformable mirrors
RT adaptive optics
light modulation
phase modulation
segmented mirrors

Delta 3 launch vehicle
(added October 1998)
GS launch vehicles
Delta launch vehicle
Delta 3 launch vehicle

Delta 4 launch vehicle
(added October 1998)
GS launch vehicles
Delta launch vehicle
Delta 4 launch vehicle

dielectric waveguides
(added February 1998)
GS waveguides
dielectric waveguides
RT dielectrics
microwave transmission
optical waveguides
waveguide antennas
waveguide filters

differential games
(added October 1998)
GS games
differential games
RT minimax technique
optimal control
pursuit-evasion games
stochastic processes
zero sum games

digital cameras
(added July 1998)
GS optical equipment
cameras
digital cameras
photographic equipment
cameras
digital cameras
RT CCD cameras
digital systems
digital techniques
photogrammetry
television cameras
video equipment

DS1 (space mission)
USE **Deep Space 1 Mission**

dubnium
(added May 1998)
GS chemical elements
dubnium
RT rutherfordium
seaborgium

E

EAM (physical chemistry)
USE **embedded atom method**

electronic structure
(added April 1999)
SN (THE TERM 'ATOMIC STRUCTURE' WAS USED FOR THIS CONCEPT PRIOR TO MAY 1999)
RT atomic structure
band structure of solids
electron energy
electron orbitals
electron states
energy bands
energy gaps (solid state)
energy levels
Fermi liquids

embedded atom method
(added February 1998)
DEF A semiempirical calculation method developed by Daw and Baskes for determining the energetics of atoms in a bulk environment. The original form of the method was based on density functional theory and was intended primarily for tight-packed transition metals. More recent modifications have extended the applicability of the method to a large number of elements in the periodic table.
UF *EAM (physical chemistry)*
MEAM (physical chemistry)
modified embedded atom method
RT alloys
crystal defects
grain boundaries
interatomic forces
metals
os methodology
molecular dynamics
potential energy

enantiomeric compounds
USE **enantiomers**

enantiomers
(added August 1998)
DEF Isomeric pairs whose crystalline forms or molecular structures are non-superimposable mirror images.
UF *enantiomeric compounds*
enantiomorphs
GS isomers
enantiomers
RT chirality
crystal structure
isomorphism
molecular structure
stereochemistry
symmetry

enantiomorphs
USE **enantiomers**

environmental cleanup
(added February 1999)
GS cleaning
environmental cleanup
RT decontamination
environment management
environment protection
hazardous wastes
oil pollution
oil slicks
pollution control
reclamation
soil pollution
waste disposal
waste treatment
water pollution
water treatment

EOS AM 1 spacecraft
USE **Terra spacecraft**

Euler Bernoulli beam theory
USE **Euler-Bernoulli beams**

Euler-Bernoulli beams
(added April 1998)
UF *Euler Bernoulli beam theory*
GS structural members
beams (supports)

Euler-Bernoulli beams
RT axial strain
bending
bending vibration
dynamic structural analysis
elastic properties
mathematical models
partial differential equations
structural analysis
Timoshenko beams

evanescent waves
(added March 1998)
GS surface waves
evanescent waves
RT acoustic impedance
evanescence
fiber optics
internal waves
plane waves
propagation modes
reflected waves
wave propagation
xx waves

F

FDTD (mathematics)
USE **finite difference time domain method**

ferroelastic materials
(added June 1998)
GS **ferroelastic materials**
shape memory alloys
nitinol alloys
RT ceramics
ferroelasticity
ferroelectric materials
xx materials
smart materials

ferroelasticity
(added June 1998)
GS mechanical properties
elastic properties
ferroelasticity
RT crystal structure
domain wall
ferroelastic materials
ferroelectricity
phase transformations
shape memory alloys
smart materials

field tests
(added November 1998)
SN (EXCLUDES TESTS OF ELECTRIC, MAGNETIC, OR ELECTROMAGNETIC FIELDS)
DEF Tests carried out in the actual setting in which the subject device is intended to operate
RT environmental tests
performance tests
xx tests

finite difference time domain method
(added April 1999)
UF *FDTD (mathematics)*
GS analysis (mathematics)
numerical analysis
approximation
finite difference theory
finite difference time domain method
time domain analysis
finite difference time domain method
RT computational electromagnetics
electromagnetic scattering

free-space optical communication
(added June 1998)
GS telecommunication
communication
optical communication
free-space optical communication
RT high power lasers
laser beams
satellite communication
space communication

free-space optical interconnects
(added June 1998)
UF *FSOI (integrated optics)*
GS optical interconnects
free-space optical interconnects
RT integrated optics
interprocessor communication
optical computers
optical switching
optoelectronic devices
photonics

frequency domain analysis
(added April 1999)
GS analysis (mathematics)
frequency domain analysis
RT control systems design
dynamic response
frequency response
parameter identification
signal processing

FSOI (integrated optics)
USE **free-space optical interconnects**

fullerides
(added February 1998)
GS carbon compounds
fullerides
RT xx alkali metal compounds
xx chemical compounds
doped crystals
fullerenes
superconductors (materials)

fuselage-wing stores
USE **wing-fuselage stores**

G

Gabor filters
(added February 1998)
GS image filters
Gabor filters
RT computer vision
xx filters
Gabor transformation
image analysis
image processing
low pass filters
neural nets
spatial filtering
textures

Gabor transformation
(added February 1998)
GS transformations (mathematics)
Gabor transformation
RT Fourier transformation
Gabor filters
holography
image processing
signal analysis
wavelet analysis

games
(added October 1998)
GS **games**
differential games
pursuit-evasion games
war games
zero sum games
RT control theory
game theory
optimization

Genesis mission
(added February 1999)
DEF A space mission to collect solar wind samples from a halo orbit about the sun-Earth L1 point for two years, returning those samples to Earth in 2003 for analysis and examination. Analysis of the samples collected by the mission will contribute to an understanding of the origins of the solar system.
GS space missions
Genesis mission
RT solar system evolution
solar wind

Godunov method
(added February 1998)
DEF Non-oscillatory finite-volume scheme that incorporates the exact or approximate solution to the Riemann initial-value problem, or a generalization of it.
GS analysis (mathematics)
numerical analysis
finite volume method
Godunov method
procedures
finite volume method
Godunov method
RT approximation
Cauchy problem
Cauchy-Riemann equations
computational fluid dynamics
Euler equations of motion
finite difference theory
shock wave interaction
supersonic flow

H

H-2 control
(added February 1998)
GS automatic control
optimal control
H-2 control
optimization
optimal control
H-2 control
RT control systems design
control theory
controllers
feedback control
H-infinity control
linear quadratic Gaussian control

Hale-Bopp comet
(added July 1998)
DEF Long-period comet discovered July 23, 1995, designated C/1995 O1.
GS celestial bodies
comets
Hale-Bopp comet
RT Oort cloud

hardware-in-the-loop simulation
(added February 1999)
UF *hardware-in-the-loop tests*
GS simulation

hardware-in-the-loop simulation
RT computerized simulation
control simulation
performance tests
systems simulation

hardware-in-the-loop tests
USE **hardware-in-the-loop simulation**

hassium
(added May 1998)
GS chemical elements
hassium
RT bohrium
meitnerium

head up tilt
(added March 1998)
DEF Body posture while lying on a tilt table with the head higher than the rest of the body.
UF *HUT (physiology)*
GS posture
head up tilt
RT aerospace medicine
bed rest
bioastronautics
cardiovascular system
gravitational physiology
head down tilt
hemodynamic responses
lower body negative pressure
orthostatic tolerance
physiological responses
supine position
weightlessness simulation

heavy fermion superconductors
(added April 1999)
GS conductors
superconductors (materials)
heavy fermion superconductors
intermetallics
heavy fermion systems
heavy fermion superconductors

heavy fermion systems
(added April 1999)
GS intermetallics
heavy fermion systems
heavy fermion superconductors
RT fermions
superconductors (materials)

HUT (physiology)
USE **head up tilt**

hybrid Trefftz finite element method
USE **finite element method**
Trefftz method

hypothetical planets
(added June 1998)
UF *Phaethon (hypothetical planet)*
planet X
transplutonic planets
GS celestial bodies
planets
hypothetical planets
RT comets
extrasolar planets
planetary orbits

I

in vitro methods and tests
(added May 1999)
DEF Tests of, or methods related to, biological or biochemical processes occurring in an artificial environment or outside of a living cell or organism.
RT bioassay
biotechnology
conditions
culture techniques
cytology
fertilization
histology
in vivo methods and tests
∞ methodology
∞ tests

in vivo methods and tests
(added May 1999)
DEF Tests of, or methods related to, biological or biochemical processes occurring within a living cell or organism.
RT bioassay
biotechnology
conditions
culture techniques
cytology
histology
in vitro methods and tests
intravenous procedures
∞ methodology
∞ tests

inflight simulation
USE **in-flight simulation**

in-flight simulation
(added October 1998)
DEF The use of a specialized test aircraft to simulate the flight characteristics of another vehicle. The test aircraft is typically capable of duplicating the computed responses of the simulated vehicle through special aerodynamic and control system features.
UF *inflight simulation*
GS simulation
flight simulation
in-flight simulation
RT aircraft control
flight characteristics
flight control
flight simulators
flight tests
training simulators

intelligent materials
USE **smart materials**

intercalibration
(added January 1999)
DEF Calibration between two or more data sources including (1) the comparison of data sets acquired by different types of measurement systems for the purpose of deducing the calibration values for one of the measurement systems, (2) the mutual calibration of data from different measurement systems through the comparison of the data with model calculations, and (3) the calibration of multiple detectors on a single instrument through the comparison of data from each detector.
GS calibrating
intercalibration
RT comparison
correction
multisensor applications
standardization

ion optics
(added June 1999)
RT beam waveguides
beamforming
electron optics
ion beams
ion engines
ion propulsion
mass spectrometers
∞ optics

Iridium network
(added December 1998)
DEF A 66-satellite wireless personal telecommunications network designed to provide worldwide telephone, paging, facsimile and data services to handheld or mobile equipment.
UF *Iridium satellites*
GS networks
communication networks
Iridium network
satellite networks
satellite constellations
Iridium network
RT communication satellites
facsimile communication
mobile communication systems
satellite communication
telephony
wireless communication

Iridium satellites
USE **communication satellites**
Iridium network

J

Java (programming language)
(added December 1998)
GS languages
programming languages
high level languages
Java (programming language)
RT C++ (programming language)
client server systems
internets
object oriented programming
World Wide Web

Josephson effect
(added April 1999)
UF *Josephson tunneling*
RT electron tunneling
Josephson junctions
SIS (superconductors)
superconducting devices
superconductors (materials)

Josephson tunneling
USE **Josephson effect**

K

kink bands
(added March 1998)
RT buckling
compression loads
edge dislocations
failure modes
fiber composites
microstructure
plastic deformation
reinforcing fibers
single crystals

kinking
(added April 1998)
RT bending
buckling
compression loads
cracking (fracturing)
deformation
displacement
failure modes
fiber composites
folding
heaving
twisting
wrinkling

L

Laves phases
(added August 1998)
GS solid phases
Laves phases
RT alloys
crystal lattices
crystal structure
cubic lattices
interstitials
microstructure
phase transformations

Long March launch vehicles
(added January 1999)
GS launch vehicles
Long March launch vehicles
RT Chinese space program
Chinese spacecraft
heavy lift launch vehicles

Lunar Prospector
(added February 1998)
GS artificial satellites
lunar satellites
Lunar Prospector
lunar spacecraft
lunar satellites
Lunar Prospector
RT lunar composition
lunar exploration
lunar programs
lunar resources
lunar surface

M

magnetostratigraphy
(added April 1999)
GS stratigraphy
magnetostratigraphy
RT geochronology
paleomagnetism

Mars Climate Orbiter
(added March 1999)
DEF One of two spacecraft comprising the Mars Surveyor 98 program, launched December 1998. After obtaining a polar, nearly circular orbit around Mars, the Orbiter will serve as a radio relay during the Lander surface mission; then begin monitoring the atmosphere, surface, and polar caps for a complete Martian year. The Orbiter carries two science instruments: the Pressure Modulated Infrared Radiometer and the Mars Color Imager.
UF *Mars Surveyor 98 Orbiter*
GS interplanetary spacecraft
Mars probes
Mars Climate Orbiter
unmanned spacecraft
space probes
Mars probes
Mars Climate Orbiter
RT Mars atmosphere
Mars missions
Mars Polar Lander
Mars surface
Mars Surveyor 98 Program

Mars Global Surveyor
(added March 1999)
DEF Spacecraft and related mission designed to orbit Mars over a two year period and collect data on the surface morphology, topography, composition, gravity, atmospheric dynamics, and magnetic field. Launched November 1996.
UF *MGS (spacecraft)*
GS interplanetary spacecraft
Mars probes
Mars Global Surveyor
unmanned spacecraft
space probes
Mars probes
Mars Global Surveyor
RT Mars atmosphere
Mars missions
Mars Observer
Mars surface

Mars missions
(added February 1999)
GS space missions
Mars missions
manned Mars missions
Mars sample return missions
RT Earth-Mars trajectories
Mars Climate Orbiter
Mars exploration
Mars Global Surveyor
Mars landing
Mars Observer
Mars Pathfinder
Mars Polar Lander
Mars probes
Mars surface samples
Mars Surveyor 98 Program
co missions
return to Earth space flight

Mars Polar Lander
(added March 1999)
DEF One of two spacecraft comprising the Mars Surveyor 98 program, launched January 1999. After a soft landing near the Martian south pole, the Lander will search for near-surface ice and possible surface records of cyclic climate change, and characterize physical processes key to the seasonal cycles of water, carbon dioxide and dust on Mars. Prior to landing, the Deep Space 2 microprobes will be released as part of a technology validation mission related to multiple-lander spacecraft.
UF *Mars Surveyor 98 Lander*
GS interplanetary spacecraft
Mars probes
Mars Polar Lander
unmanned spacecraft
space probes
Mars probes
Mars Polar Lander
RT Mars atmosphere
Mars Climate Orbiter
Mars missions
Mars surface
Mars Surveyor 98 Program

Mars Surveyor 98 Lander
USE **Mars Polar Lander**

Mars Surveyor 98 Orbiter
USE **Mars Climate Orbiter**

Mars Surveyor 98 Program
(added March 1999)
DEF Mars exploration program consisting of two mission spacecraft-- the Mars Climate Orbiter and the Mars Polar Lander. Two surface penetrating microprobes (part of the associated Deep Space 2 mission) for detecting water ice are also piggybacking on the Lander.
GS programs
NASA programs
NASA space programs
Mars Surveyor 98 Program
space programs
NASA space programs
Mars Surveyor 98 Program
RT Mars atmosphere
Mars Climate Orbiter
Mars missions
Mars Polar Lander
Mars surface

Martian meteorites
USE **SNC meteorites**

MEAM (physical chemistry)
USE **embedded atom method**

meitnerium
(added May 1998)
GS chemical elements
meitnerium
RT hassium

MEMS (electromechanical devices)
USE **microelectromechanical systems**

MGS (spacecraft)
USE **Mars Global Surveyor**

microelectromechanical systems
(added October 1998)
UF *MEMS (electromechanical devices)*
GS electromechanical devices
microelectromechanical systems
RT microinstrumentation
microminiaturization
microminiaturized electronic devices
microsatellites
nanosatellites

microsatellites
(added October 1998)
DEF Satellites with a total mass between 10 and 100 kg, often incorporating miniaturized electronic and mechanical systems.
UF *microsats*
GS artificial satellites
microsatellites
RT microelectromechanical systems
microminiaturization
microminiaturized electronic devices
nanosatellites
satellite constellations
satellite design
small satellite technology
small scientific satellites

microsats
USE **microsatellites**

Mindlin plate theory
USE **Mindlin plates**

Mindlin plates
(added April 1998)
UF *Mindlin plate theory*
Reissner-Mindlin plates
GS structural members
plates (structural members)
Mindlin plates
RT dynamic structural analysis
finite element method
free vibration
plate theory
Reissner theory
shear strain
structural analysis
structural vibration
thick plates

mischmetal
(added June 1998)
DEF An alloy consisting of a natural mixture of rare-earth metals, used in electrode materials and hydrogen-storage alloys, as a general alloy addition, and in the production of some aluminum alloys and steels.
GS alloys
rare earth alloys
mischmetal
RT alloying
aluminum alloys
cathodic coatings
cerium
desorption
electrode materials
intermetallics
steels

modified embedded atom method
USE **embedded atom method**

N

nacelle wing configurations
USE **wing nacelle configurations**

nanosatellites
(added October 1998)
DEF Satellites with a total mass smaller than 10 kg incorporating miniaturized electronic and mechanical systems.
UF *nanosats*
GS artificial satellites
nanosatellites
RT microelectromechanical systems
microminiaturization
microminiaturized electronic devices
microsatellites
satellite constellations
satellite design
small satellite technology
small scientific satellites

nanosats
USE **nanosatellites**

Nozomi Mars Orbiter
(added August 1998)
DEF A Japanese Mars mission spacecraft designed to study the Martian upper atmosphere and its interaction with the solar wind, and to develop technologies for use in future planetary missions. Specifically, instruments on the spacecraft enable the measurement of the structure, composition, and dynamics of the ionosphere, aeronomy effects of the solar wind, the escape of atmospheric constituents, the intrinsic magnetic field, and dust in the upper atmosphere and in-orbit around Mars.
UF *Planet-B spacecraft*
GS interplanetary spacecraft
Mars probes
Nozomi Mars Orbiter
Japanese spacecraft
Nozomi Mars Orbiter
unmanned spacecraft
space probes
Mars probes
Nozomi Mars Orbiter
RT aeronomy
Deimos
Phobos
planetary atmospheres
solar planetary interactions

O

optical interconnects
(added June 1998)
GS **optical interconnects**
free-space optical interconnects
RT connectors
electric connectors
integrated optics
optical computers
optical switching
optoelectronic devices
photonics

orbit determination
(added December 1998)
GS **orbit determination**
airborne range and orbit determination
orbit calculation
minimum variance orbit determination
orbital position estimation
RT Global Positioning System
position errors
satellite tracking
space navigation
spacecraft control
spacecraft position indicators

P

PDS (spectroscopy)
USE **photothermal deflection spectroscopy**

perfectly matched layers
(added July 1998)
DEF In the area of computational electromagnetism, an absorbing boundary condition used for terminating infinite domain calculations in the finite-difference time-domain (FDTD) or finite element methods. The approach has also been extended to the analysis of some problems in acoustics.
UF *PML (electromagnetism)*
GS conditions
boundary conditions
perfectly matched layers
RT computational electromagnetics
computational grids
electromagnetic absorption
electromagnetic scattering
finite difference theory
finite element method
Maxwell equation

Phaethon (hypothetical planet)
USE **hypothetical planets**

Phobos spacecraft
(added August 1998)
DEF Two Soviet spacecraft (Phobos 1 and 2, both launched in July 1988) designed to study the plasma environment in the Martian vicinity, the surface and atmosphere of Mars, and the surface composition of the Martian satellite Phobos. Other mission objectives included the study of the interplanetary environment and solar observations.
GS interplanetary spacecraft
Mars probes
Phobos spacecraft
Soviet spacecraft
Phobos spacecraft
unmanned spacecraft
space probes
Mars probes
Phobos spacecraft
RT Mars atmosphere
Mars environment
Phobos

photothermal deflection spectroscopy
(added November 1998)
UF *PDS (spectroscopy)*
GS spectroscopy
photothermal deflection spectroscopy
RT optical measurement
photoacoustic spectroscopy
thermal diffusivity
thermal lensing

planet X
USE **hypothetical planets**

Planet-B spacecraft
USE **Nozomi Mars Orbiter**

PML (electromagnetism)
USE **perfectly matched layers**

polyvinylidene
USE **vinylidene**

proportional navigation
(added July 1998)
GS navigation
proportional navigation
RT homing
interception
line of sight
missile control
proportional control
rendezvous guidance
terminal guidance

proton-antiproton interactions
(added June 1999)
GS particle interactions
elementary particle interactions
proton-antiproton interactions
RT annihilation reactions
antiprotons
high energy interactions
matter-antimatter propulsion

pursuit-evasion games
(added October 1998)
GS games
pursuit-evasion games
RT differential games
evasive actions
interception
optimal control
pursuit tracking

trajectory optimization
zero sum games

R

Reissner-Mindlin plates
USE **Mindlin plates**

renewable energy
(added December 1998)
GS **renewable energy**
geothermal energy utilization
hydroelectricity
tidepower
waterwave energy
windpower utilization
RT bioconversion
biomass energy production
clean energy
energy policy
ox energy sources
energy technology
geothermal energy conversion
hydrogen based energy
ocean thermal energy conversion
solar energy conversion
waste utilization
waterwave energy conversion

Ringleb flow
(added July 1998)
GS fluid flow
compressible flow
Ringleb flow
steady flow
Ringleb flow
two dimensional flow
Ringleb flow
RT critical flow
subsonic flow
transonic flow

Rossi X Ray Timing Explorer
USE **X Ray Timing Explorer**

RXTE (satellite)
USE **X Ray Timing Explorer**

S

scarf joints
(added March 1998)
DEF A joint in which the overlapping parts are tapered to form a continuous length, with no increase in dimension at the joint.
GS joints (junctions)
scarf joints
RT bolted joints
bonded joints
lap joints
metal joints
scarfing

scene generation
(added July 1998)
GS imaging techniques
scene generation
simulation
scene generation
RT computer graphics
flight simulation
image reconstruction
scientific visualization
target simulators

screech tones
(added March 1998)
DEF Discrete acoustic tones produced by imperfectly expanded supersonic jets. The phenomenon is a result of a resonant feedback condition involving downstream traveling shear layer disturbances and upstream traveling acoustic waves.
GS elastic waves
sound waves
noise (sound)
aerodynamic noise
screech tones
frequencies
acoustic frequencies
screech tones
RT aeroacoustics
feedback
jet aircraft noise
jet mixing flow
nozzle flow
shear layers
supersonic jet flow
supersonic nozzles

seaborgium
(added May 1998)
GS chemical elements
seaborgium
RT bohrium
dubnium

Sea-viewing Wide Field-of-view Sensor
(added December 1998)
UF *SeaWiFS*
GS scanners
ocean color scanner
Sea-viewing Wide Field-of-view Sensor
RT chlorophylls
Coastal Zone Color Scanner
ocean surface
phytoplankton
remote sensors
satellite-borne instruments
water color

SeaWiFS
USE **Sea-viewing Wide Field-of-view Sensor**

Service Module (ISS)
(added March 1999)
DEF Primary Russian component of the International Space Station providing an early station living quarters and life support system functions to all early elements. Also provides propulsive attitude control and reboost capability for the early station.
GS modules
space station modules
Service Module (ISS)
RT International Space Station
life support systems

Shergotty Nakhla Chassigny meteorites
USE **SNC meteorites**

Shuttle Superlightweight Tank
USE **external tanks**
propellant tanks

SLWT (propellant tank)
USE **external tanks**
propellant tanks

smart materials
(added March 1998)
DEF Engineered materials capable of responding to their environment to a significant degree, by virtue of intrinsic properties and/or built-in sensor/actuator elements. Applications of these materials include vibration suppression/isolation, precision positioning, damage detection, and tunable devices.
UF *intelligent materials*
RT actuators
composite materials
electrorheological fluids
electrostriction
ferroelastic materials
ferroelasticity
ferroelectric materials
ferromagnetic materials
ox materials
piezoelectric ceramics
ox sensors
shape memory alloys
smart structures
vibration damping

SNC meteorites
(added March 1998)
DEF Meteorites with petrologic characteristics, isotopic signatures, trapped gas compositions, and relatively young crystallization ages (less than 1.3 billion years), which together point to a Martian origin. The name of these meteorites is derived from first three known examples--Shergotty, Nakhla, and Chassigny.
UF *Martian meteorites*
Shergotty Nakhla Chassigny meteorites
GS celestial bodies
meteorites
stony meteorites
achondrites
SNC meteorites
RT chassignites
Mars (planet)
Mars surface
nakhlites
shergottites

sonochemistry
USE **ultrasonic processing**

space station modules
(added November 1998)
GS modules
space station modules
Kvant modules
Priroda module
Service Module (ISS)
Unity connecting module
Zarya control module
RT air locks
compartments
International Space Station
Mir space station
orbital assembly
space erectable structures
space station structures
spacecraft modules

space tourism
(added April 1999)
GS space industrialization
space tourism
tourism
space tourism
RT space commercialization
space transportation

space weather
(added June 1999)
SN (FOR METEOROLOGICAL CONDITIONS RELATED TO THE MIDDLE AND LOWER ATMOSPHERES OF NON-EARTH PLANETS USE "PLANETARY METEOROLOGY")
DEF The dynamic, highly variable conditions of the gas, space environment that encompasses the sun, the interplanetary medium, and the Earth magnetosphere-ionosphere-thermosphere system. Major contributing factors include variations in the solar wind, solar flares, and solar mass ejections. Effects of space weather phenomena include performance degradation of communication, navigation, and power systems on both spacecraft and ground-based systems, and potential health hazards during extravehicular activity.
RT aerospace environments
aerospace safety
Earth ionosphere
Earth magnetosphere
Earth orbital environments
geomagnetism
ionospheric disturbances
magnetic disturbances
magnetic storms
radiation hazards
solar activity effects
solar terrestrial interactions
space plasmas
weather

spiral bevel gears
(added May 1999)
GS gears
bevel gears
spiral bevel gears

Stardust Mission
(added March 1999)
DEF First U.S. mission launched to robotically obtain samples in outer space and return them to Earth. The NASA Discovery-class mission will return dust samples collected from the debris cloud surrounding the nucleus of Comet Wild 2. Interstellar dust will also be collected. The mission spacecraft takes advantage of an Earth gravity-assist maneuver to reach the comet, and uses an aerogel-based dust collector.
GS space missions
flyby missions
Stardust Mission
RT comet nuclei
interstellar matter
Wild 2 comet

superhumps (astronomy)
(added October 1998)
RT accretion disks
astronomical photometry
binary stars
cataclysmic variables
dwarf novae
eclipsing binary stars
stellar spectrophotometry

T

Terra spacecraft
(added June 1999)
DEF First in a series of EOS (Earth Observing System) spacecraft developed to advance the understanding of the ways that the Earth's lands, oceans, air, ice, and life function as a total environmental system. The spacecraft carries five high-resolution instruments: the Advanced Spaceborne Thermal Emission Radiometer (ASTER); the Clouds and the Earth Radiant Energy System (CERES); the Multi-Angle Imaging Spectroradiometer (MISR); the Moderate Resolution Imaging Spectroradiometer (MODIS); and the Measurements of Pollution in the Troposphere (MOPITT) instrument.
UF *AM-1 (EOS) spacecraft*
EOS AM-1 spacecraft
GS artificial satellites
Terra spacecraft
Earth Observing System (EOS)
Terra spacecraft
RT Earth observations (from space)
remote sensing

thermal lenses
USE **thermal lensing**

thermal lensing
(added November 1998)
UF *thermal lenses*
GS **thermal lensing**
thermal blooming
RT atmospheric optics
focusing
laser beams
photothermal deflection spectroscopy
wave front deformation

time domain analysis
(added April 1999)
GS analysis (mathematics)
time domain analysis
finite difference time domain method
RT control systems design
dynamic response
parameter identification
signal processing
time response

time synchronization
(added December 1998)
GS synchronism
time synchronization
RT clocks
frequency standards
frequency synchronization
Global Positioning System
time measurement
time signals
universal time

Titan 4B launch vehicle
(added October 1998)
GS launch vehicles
Titan launch vehicles
Titan 4 launch vehicle
Titan 4B launch vehicle
rocket vehicles
multistage rocket vehicles
Titan launch vehicles
Titan 4 launch vehicle
Titan 4B launch vehicle
RT Cassini mission
laser gyroscopes

tourism
(added April 1999)
GS **tourism**
space tourism
RT industries
recreation
transportation
travel

TRACE satellite
USE **Transition Region and Coronal Explorer**

Transition Region and Coronal Explorer
(added May 1998)
DEF Small Explorer Mission satellite supporting the investigation of the relationships between fine-scale magnetic fields and their associated plasma structures in the transition region and coronal corona of the Sun.
UF *TRACE satellite*
GS artificial satellites
scientific satellites
Explorer satellites
Transition Region and Coronal Explorer
RT chromosphere
SOHO Mission
solar atmosphere
solar corona
solar magnetic field
solar observations
solar physics
solar transition region

transplutonic planets
USE **hypothetical planets**

transverse momentum
(added June 19[illegible])
GS momentum
transverse momentum
RT angular momentum
elementary particle interactions
particle motion
transverse acceleration

Trefftz method
(added July 1998)
DEF Boundary-type approximation scheme for the solution of boundary value problems for partial differential equations.
UF *hybrid Trefftz finite element method*
GS analysis (mathematics)
numerical analysis
approximation
boundary element method
Trefftz method
RT bending theory
boundary conditions
boundary value problems
finite element method
partial differential equations
plate theory
structural analysis

TRMM satellite
(added May 1998)
DEF Satellite supporting the joint US-Japanese Tropical Rainfall Measuring Mission (TRMM) to explore tropical rainfall and its effects on the Earth energy budget, general circulation, and climate. The TRMM satellite represents the first dual deployment of a precipitation radar and passive microwave radiometer on an Earth-viewing satellite.
UF *Tropical Rainfall Measuring Mission sat*
GS artificial satellites
meteorological satellites
TRMM satellite
scientific satellites
TRMM satellite
RT atmospheric circulation
Earth radiation budget
equatorial atmosphere
rain
tropical meteorology

Tropical Rainfall Measuring Mission sat
USE **TRMM satellite**

U

Ukrainian space program
(added January 1999)
GS programs
space programs
Ukrainian space program
RT Ukraine
Zenit launch vehicles

ultrasonic processing
(added June 1998)
DEF The use of ultrasonic radiation to synthesize a compound or material, or alter the structure, properties, or form of a material.
UF *sonochemistry*
ultrasonic treatment
RT processing
ultrasonic cleaning
ultrasonics

ultrasonic treatment
USE **ultrasonic processing**

undercooling
USE **supercooling**

Unity connecting module
(added November 1998)
DEF Component of the International Space Station providing six ports that serve as connecting points for other station modules and framework elements.
GS modules
space station modules
Unity connecting module
RT International Space Station
spacecraft docking

V

VentureStar launch vehicle
(added June 1999)
DEF Reusable single-stage-to-orbit launch vehicle employing linear aerospike engines and having a payload capacity roughly equivalent to that of the Space Shuttle, developed in coordination with the X-33 advanced technology demonstrator vehicle.
GS aerospace vehicles
aerospace planes
VentureStar launch vehicle
maneuverable spacecraft
aerospace planes
VentureStar launch vehicle
manned spacecraft
aerospace planes
VentureStar launch vehicle
reentry vehicles
recoverable spacecraft
reusable spacecraft
aerospace planes
VentureStar launch vehicle
soft landing spacecraft
aerospace planes
VentureStar launch vehicle
RT aerospike engines
commercial spacecraft
X-33 reusable launch vehicle

very large transport aircraft
(added November 1998)
DEF Aircraft capable of a maximum takeoff weight greater than 400 metric tons (881,600 lbs) or having a seating capacity greater than 660.
UF *VLTA (aircraft)*
GS transport aircraft
very large transport aircraft
RT cargo aircraft
passenger aircraft

VLTA (aircraft)
USE **very large transport aircraft**

W

water sampling
(added March 1998)
DEF The process of obtaining a representative sample of water from any natural or artificial environment.
GS sampling
water sampling
RT environmental monitoring
ground water
pollution monitoring
sea water
surface water
water
water pollution
water quality

wave rotors
(added March 1998)
DEF Rotor devices that use gasdynamic waves to transfer energy rather than the motion of solid surfaces. Typically, they consist of a series of passages arranged on a drum which rotates about an axis. Through rotation, the ends of the passages are periodically exposed to various circumferentially arranged ports which initiate the traveling expansion or compression waves within the passages. The particular circumferential location of the ports determines the thermodynamic cycle of the working fluid.
GS rotating bodies
rotors
wave rotors
RT compression waves
energy transfer
engine parts
gas dynamics
gas generators
gas turbine engines
topping cycle engines
turbomachinery
turboshafts
wave generation

Wild 2 comet
(added March 1999)
DEF Periodic comet discovered January 1978, relatively new to the inner Solar System due to a shift in its orbit caused by the gravitational influence of Jupiter.
GS celestial bodies
comets
Wild 2 comet
RT Stardust Mission

wing-body and tail configurations
USE **body-wing and tail configurations**

wing-body configurations
USE **body-wing configurations**

X

X-32 aircraft
(added October 1998)
DEF Experimental supersonic strike fighter developed to be configured as a conventional or short takeoff/vertical landing vehicle. Developed as part of the Joint Strike Fighter (JSF) program.
GS Boeing aircraft
X-32 aircraft
jet aircraft
X-32 aircraft
research vehicles
research aircraft
X-32 aircraft
supersonic aircraft
X-32 aircraft
V/STOL aircraft
X-32 aircraft

X-35 aircraft
(added October 1998)
DEF Experimental strike fighter incorporating a vertical lift fan for short takeoff/vertical landing capability. Developed as part of the Joint Strike Fighter (JSF) program.
GS jet aircraft
X-35 aircraft
Lockheed aircraft
X-35 aircraft
research vehicles
research aircraft
X-35 aircraft
V/STOL aircraft
X-35 aircraft

Z

Zarya control module
(added November 1998)
DEF Component of the International Space Station providing propulsion, steering, and communications during the early assembly stages of the station, later serving as a docking port and fuel tank. Zarya was built by Russia under contract to the U.S. and is owned by the U.S.
GS modules
space station modules
Zarya control module
RT International Space Station

Zenit launch vehicles
(added January 1999)
GS launch vehicles
Zenit launch vehicles
RT sea launching
Ukrainian space program

zero sum games
(added October 1998)
GS games
zero sum games
RT differential games
Markov processes
optimal control
pursuit-evasion games
saddle points (game theory)

NASA THESAURUS SUPPLEMENT

PART 2
ROTATED TERM DISPLAY

NUMERALS

AM- **1** (EOS) spacecraft
use Terra spacecraft
Deep Space **1** Mission
EOS AM- **1** spacecraft
use Terra spacecraft
Wild **2** comet
H- **2** control
Delta **3** launch vehicle
Delta **4** launch vehicle
Titan **4B** launch vehicle
X- **32** aircraft
X- **35** aircraft
Mars Surveyor **98** Lander
use Mars Polar Lander
Mars Surveyor **98** Orbiter
use Mars Climate Orbiter
Mars Surveyor **98** Program
Boeing **717** aircraft

A

Dark-star unmanned **aerial** vehicle
use pilotless aircraft
reconnaissance aircraft
aeroshells
Boeing 717 **aircraft**
very large transport **aircraft**
VLTA **(aircraft)**
use very large transport aircraft
X-32 **aircraft**
X-35 **aircraft**
Alpha Magnetic Spectrometer
AM-1 (EOS) spacecraft
use Terra spacecraft
EOS **AM**-1 spacecraft
use Terra spacecraft
AMS (spectrometer)
use Alpha Magnetic Spectrometer
frequency domain **analysis**
time domain **analysis**
anisoplanatism
antenna gain
antiphase boundaries
antiphase domains
use antiphase boundaries
proton- **antiproton** interactions
APB (materials)
use antiphase boundaries
archaeomagnetism
use paleomagnetism
superhumps **(astronomy)**
Chandra X-Ray **Astrophysics** Facility
use X-Ray Astrophysics Facility
embedded **atom** method
modified embedded **atom** method
use embedded atom method

B

Planet- **B** spacecraft
use Nozomi Mars Orbiter
kink **bands**
Euler-Bernoulli **beam** theory
use Euler-Bernoulli beams
Euler-Bernoulli **beams**
Euler- **Bernoulli** beam theory
use Euler-Bernoulli beams
Euler- **Bernoulli** beams
bevel gears
spiral **bevel** gears
Biot-Savart law
wing- **body** and tail configurations
use body-wing and tail configurations
wing- **body** configurations
use body-wing configurations
Boeing 717 aircraft
bohrium
Hale- **Bopp** comet
antiphase **boundaries**

C

digital **cameras**
cascode devices
chain reactions (chemistry)
chain reactions (nuclear physics)
Chandra X-Ray Astrophysics Facility
use X-Ray Astrophysics Facility
Shergotty Nakhla **Chassigny** meteorites
use SNC meteorites
chain reactions **(chemistry)**
EAM (physical **chemistry)**
use embedded atom method
MEAM (physical **chemistry)**
use embedded atom method
clamped structures
environmental **cleanup**
Mars **Climate** Orbiter
Hale-Bopp **comet**
Wild 2 **comet**
Comet Nucleus Tour
free-space optical **communication**
enantiomeric **compounds**
use enantiomers
nacelle wing **configurations**
use wing nacelle configurations
wing-body **configurations**
use body-wing configurations
wing-body and tail **configurations**
use body-wing and tail configurations
Unity **connecting** module
CONTOUR (mission)
use Comet Nucleus Tour
H-2 **control**
Zarya **control** module
Transition Region and **Coronal** Explorer

corrugated waveguides
cuprates
cycloaddition

D

Darkstar unmanned aerial vehicle
use pilotless aircraft
reconnaissance aircraft
Deep Space 1 Mission
photothermal **deflection** spectroscopy
deformable mirrors
Delta 3 launch vehicle
Delta 4 launch vehicle
orbit **determination**
cascode **devices**
MEMS (electromechanical **devices)**
use microelectromechanical systems
dielectric waveguides
finite **difference** time domain method
differential games
digital cameras
frequency **domain** analysis
time **domain** analysis
finite difference time **domain** method
antiphase **domains**
use antiphase boundaries
DS1 (space mission)
use Deep Space 1 Mission
dubnium

E

EAM (physical chemistry)
use embedded atom method
Josephson **effect**
PML **(electromagnetism)**
use perfectly matched layers
MEMS **(electromechanical** devices)
use microelectromechanical systems
electronic structure
hybrid-Trefftz finite **element** method
use finite element method
Trefftz method
embedded atom method
modified **embedded** atom method
use embedded atom method
enantiomeric compounds
use enantiomers
enantiomers
enantiomorphs
use enantiomers
renewable **energy**
environmental cleanup
AM-1 **(EOS**) spacecraft
use Terra spacecraft
EOS AM-1 spacecraft
use Terra spacecraft
Euler-Bernoulli beam theory
use Euler-Bernoulli beams
Euler-Bernoulli beams
evanescent waves
pursuit- **evasion** games
Rossi X Ray Timing **Explorer**
use X Ray Timing Explorer
Transition Region and Coronal **Explorer**

F

Chandra X Ray Astrophysics **Facility**
use X Ray Astrophysics Facility
FDTD (mathematics)
use finite difference time domain method
heavy **fermion** superconductors
heavy **fermion** systems
ferroelastic materials
ferroelasticity
Sea-viewing Wide **Field**-of-view Sensor
field tests
Gabor **filters**
finite difference time domain method
hybrid-Trefftz **finite** element method
use finite element method
Trefftz method
in- **flight** simulation
Ringleb **flow**
free-space optical communication
free-space optical interconnects
frequency domain analysis
FSOI (integrated optics)
use free-space optical interconnects
fullerides
fuselage-wing stores
use wing-fuselage stores

G

Gabor filters
Gabor transformation
antenna **gain**
games
differential **games**
pursuit-evasion **games**
zero sum **games**
bevel **gears**
spiral bevel **gears**
scene **generation**
Genesis mission
Mars **Global** Surveyor
Godunov method

H

H-2 control
Hale-Bopp comet
hardware-in-the-loop simulation
hardware-in-the-loop tests
use hardware-in-the-loop simulation
hassium
head up tilt
heavy fermion superconductors
heavy fermion systems
HUT (physiology)
use head up tilt
hybrid Trefftz finite element method
use finite element method
Trefftz method
Phaethon **(hypothetical** planet)
use hypothetical planets
hypothetical planets

I

in vitro methods and tests
in vivo methods and tests
inflight simulation
  use in-flight simulation
FSOI **(integrated** optics)
  use free-space optical interconnects
intelligent materials
  use smart materials
proton-antiproton **interactions**
intercalibration
free-space optical **interconnects**
optical **interconnects**
ion optics
Iridium network
Iridium satellites
  use communication satellites
    Iridium network
Service Module **(ISS)**

J

Java (programming language)
scarf **joints**
Josephson effect
Josephson tunneling
  use Josephson effect

K

kink bands
kinking

L

Mars Polar **Lander**
Mars Surveyor 98 **Lander**
  use Mars Polar Lander
Java (programming **language)**
very **large** transport aircraft
Delta 3 **launch** vehicle
Delta 4 **launch** vehicle
Titan 4B **launch** vehicle
VentureStar **launch** vehicle
Long March **launch** vehicles
Zenit **launch** vehicles
Laves phases
Biot-Savart **law**
perfectly matched **layers**
thermal **lenses**
  use thermal lensing
thermal **lensing**
Long March launch vehicles
hardware-in-the- **loop** simulation
hardware-in-the- **loop** tests
Lunar Prospector

M

Alpha **Magnetic** Spectrometer
magnetostratigraphy
Long **March** launch vehicles
Mars Climate Orbiter
Mars Global Surveyor
Mars missions
Nozomi **Mars** Orbiter
Mars Polar Lander
Mars Surveyor 98 Lander
  use Mars Polar Lander
Mars Surveyor 98 Orbiter
  use Mars Climate Orbiter
Mars Surveyor 98 Program
Martian meteorites
  use SNC meteorites
perfectly **matched** layers
APB **(materials)**
  use antiphase boundaries
ferroelastic **materials**
intelligent **materials**
  use smart materials
smart **materials**
FDTD **(mathematics)**
  use finite difference time domain method
MEAM (physical chemistry)
  use embedded atom method
Tropical Rainfall **Measuring** Mission sat
  use TRMM satellite
meitnerium
MEMS (electromechanical devices)
  use microelectromechanical systems
Martian **meteorites**
  use SNC meteorites
Shergotty Nakhla Chassigny **meteorites**
  use SNC meteorites
SNC **metcorites**
embedded atom **method**
finite difference time domain **method**
Godunov **method**
hybrid-Trefftz finite element **method**
  use finite element method
    Trefftz method
modified embedded atom **method**
  use embedded atom method
Trefftz **method**
in vitro **methods** and tests
in vivo **methods** and tests
MGS (spacecraft)
  use Mars Global Surveyor
microelectromechanical systems
microsatellites
microsats
  use microsatellites
Mindlin plate theory
  use Mindlin plates
Mindlin plates
Reissner- **Mindlin** plates
  use Mindlin plates
deformable **mirrors**
mischmetal
COMTOUR **(mission)**
  use Comet Nucleus Tour
Deep Space 1 **Mission**
DS1 (space **mission)**
  use Deep Space 1 Mission
Genesis **mission**
Stardust **Mission**
Tropical Rainfall Measuring **Mission** sat
  use TRMM satellite
Mars **missions**
modified embedded atom method
  use embedded atom method
Unity connecting **module**
Zarya control **module**

Service **Module** (ISS)
space station **modules**
transverse **momentum**

N

nacelle wing configurations
use wing nacelle configurations
Shergotty **Nakhla** Chassigny meteorites
use SNC meteorites
nanosatellites
nanosats
use nanosatellites
proportional **navigation**
Iridium **network**
Nozomi Mars Orbiter
chain reactions **(nuclear** physics)
Comet **Nucleus** Tour

O

free-space **optical** communication
optical interconnects
free-space **optical** interconnects
FSOI (integrated **optics)**
use free-space optical interconnects
ion **optics**
orbit determination
Mars Climate **Orbiter**
Mars Surveyor 98 **Orbiter**
use Mars Climate Orbiter
Nozomi Mars **Orbiter**

P

PDS (spectroscopy)
use photothermal deflection spectroscopy
perfectly matched layers
Phaethon (hypothetical planet)
use hypothetical planets
Laves **phases**
Phobos spacecraft
photothermal deflection spectroscopy
EAM **(physical** chemistry)
use embedded atom method
MEAM **(physical** chemistry)
use embedded atom method
chain reactions (nuclear **physics)**
HUT **(physiology)**
use head up tilt
Phaethon (hypothetical **planet)**
use hypothetical planets
Planet-B spacecraft
use Nozomi Mars Orbiter
planet X
use hypothetical planets
hypothetical **planets**
transplutonic **planets**
use hypothetical planets
Mindlin **plate** theory
use Mindlin plates
Mindlin **plates**
Reissner-Mindlin **plates**
use Mindlin plates
PML (electromagnetism)
use perfectly matched layers
Mars **Polar** Lander
polyvinylidene
use vinylidene
ultrasonic **processing**
Mars Surveyor 98 **Program**
Ukrainian space **program**
Java **(programming** language)
SLWT **(propellant** tank)
use external tanks
propellant tanks
proportional navigation
Lunar **Prospector**
proton–antiproton interactions
pursuit–evasion games

R

Tropical **Rainfall** Measuring Mission sat
use TRMM satellite
Chandra X **Ray** Astrophysics Facility
use X Ray Astrophysics Facility
Rossi X **Ray** Timing Explorer
use X Ray Timing Explorer
chain **reactions** (chemistry)
chain **reactions** (nuclear physics)
Transition **Region** and Coronal Explorer
Reissner–Mindlin plates
use Mindlin plates
renewable energy
Ringleb flow
Rossi X Ray Timing Explorer
use X Ray Timing Explorer
wave **rotors**
RXTE (satellite)
use X Ray Timing Explorer

S

water **sampling**
Tropical Rainfall Measuring Mission **sat**
use TRMM satellite
RXTE **(satellite)**
use X Ray Timing Explorer
TRACE **satellite**
use Transition Region and Coronal Explorer
TRMM **satellite**
Iridium **satellites**
use communication satellites Iridium network
Biot- **Savart** law
scarf joints
scene generation
screech tones
Sea-viewing Wide Field-of-view Sensor
seaborgium
SeaWiFS
use Sea-viewing Wide Field-of-view Sensor
Sea-viewing Wide Field-of-view **Sensor**
Service Module (ISS)
Shergotty Nakhla Chassigny meteorites
use SNC meteorites

Shuttle Superlightweight Tank
use external tanks propellant tanks
hardware-in-the-loop **simulation**
in-flight **simulation**
inflight **simulation**
use in-flight simulation
SLWT (propellant tank)
use external tanks propellant tanks
smart materials
SNC meteorites
sonochemistry
use ultrasonic processing
Deep **Space** 1 Mission
DS1 **(space** mission)
use Deep Space 1 Mission
free- **space** optical communication
free- **space** optical interconnects
Ukrainian **space** program
space station modules
space tourism
space weather
AM-1 (EOS) **spacecraft**
use Terra spacecraft
EOS AM-1 **spacecraft**
use Terra spacecraft
MGS **(spacecraft)**
use Mars Global Surveyor
Phobos **spacecraft**
Planet-B **spacecraft**
use Nozomi Mars Orbiter
Terra **spacecraft**
Alpha Magnetic **Spectrometer**
AMS **(spectrometer)**
use Alpha Magnetic Spectrometer
PDS **(spectroscopy)**
use photothermal deflection spectroscopy
photothermal deflection **spectroscopy**
spiral bevel gears
Stardust Mission
space **station** modules
fuselage-wing **stores**
use wing-fuselage stores
electronic **structure**
clamped **structures**
zero **sum** games
heavy fermion **superconductors**
superhumps (astronomy)
Shuttle **Superlightweight** Tank
use external tanks propellant tanks
Mars Global **Surveyor**
Mars **Surveyor** 98 Lander
use Mars Polar Lander
Mars **Surveyor** 98 Orbiter
use Mars Climate Orbiter
Mars **Surveyor** 98 Program
time **synchronization**
heavy fermion **systems**
microelectromechanical **systems**

T

wing-body and **tail** configurations
use body-wing and tail configurations
Shuttle Superlightweight **Tank**
use external tanks propellant tanks
SLWT (propellant **tank)**
use external tanks propellant tanks
Terra spacecraft
field **tests**
hardware-in-the-loop **tests**
use hardware-in-the-loop simulation
in vitro methods and **tests**
in vivo methods and **tests**
Euler-Bernoulli beam **theory**
use Euler-Bernoulli beams
Mindlin plate **theory**
use Mindlin plates
thermal lenses
use thermal lensing
thermal lensing
head up **tilt**
time domain analysis
finite difference **time** domain method
time synchronization
Rossi X Ray **Timing** Explorer
use X Ray Timing Explorer
Titan 4B launch vehicle
screech **tones**
Comet Nucleus **Tour**
tourism
space **tourism**
TRACE satellite
use Transition Region and Coronal Explorer
Gabor **transformation**
Transition Region and Coronal Explorer
transplutonic planets
use hypothetical planets
very large **transport** aircraft
transverse momentum
ultrasonic **treatment**
use ultrasonic processing
hybrid- **Trefftz** finite element method
use finite element method Trefftz method
Trefftz method
TRMM satellite
Tropical Rainfall Measuring Mission sat
use TRMM satellite
Josephson **tunneling**
use Josephson effect

U

Ukrainian space program
ultrasonic processing
ultrasonic treatment
use ultrasonic processing
undercooling
use supercooling
Unity connecting module
Darkstar **unmanned** aerial vehicle
use pilotless aircraft reconnaissance aircraft
head **up** tilt

V

Darkstar unmanned aerial **vehicle**
use pilotless aircraft
reconnaissance aircraft
Delta 3 launch **vehicle**
Delta 4 launch **vehicle**
Titan 4B launch **vehicle**
VentureStar launch **vehicle**
Long March launch **vehicles**
Zenit launch **vehicles**
VentureStar launch vehicle
very large transport aircraft
Sea-viewing Wide Field-of- **view** Sensor
Sea- **viewing** Wide Field-of-view Sensor
in **vitro** methods and tests
in **vivo** methods and tests
VLTA (aircraft)
use very large transport aircraft

W

water sampling
wave rotors
corrugated **waveguides**
dielectric **waveguides**
evanescent **waves**
space **weather**
Sea-viewing **Wide** Field-of-view Sensor
Wild 2 comet
wing-body and tail configurations
use body-wing and tail configurations
wing-body configurations
use body-wing configurations
nacelle **wing** configurations
use wing nacelle configurations
fuselage- **wing** stores
use wing-fuselage stores

X

planet **X**
use hypothetical planets
X-32 aircraft
X-35 aircraft
Chundra **X** Ray Astrophysics Facility
use X Ray Astrophysics Facility
Rossi **X** Ray Timing Explorer
use X Ray Timing Explorer

Z

Zarya control module
Zenit launch vehicles
zero sum games

NASA THESAURUS SUPPLEMENT

PART 3
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The NASA Thesaurus Supplement is a cumulative update to the 1998 edition of the NASA Thesaurus (NASA/SP-1998-7501). The Supplement, published every six months, includes all new terms and associated hierarchies added since the cutoff for the 1998 edition (December 1997). Parts 1 and 2 (Hierarchical Listing and Rotated Term Display) correspond to Volumes 1 and 2 of the 1998 printed edition. Definitions are included in Part 1; uppercase/lowercase forms are provided in both Parts 1 and 2. Part 3 is a list of deletions or changes to valid terms.

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